

AMENDMENTS

Please cancel the pending claims, *i.e.*, claims 1-5 and 7-21, without prejudice.

Please add new claims 22-53 as follows:

22. (New) A nucleic acid molecule comprising a nucleotide sequence encoding a biofilament polypeptide and a regulatory sequence that directs expression of a polypeptide in milk-producing cells of a ruminant, wherein said regulatory sequence is operably linked to said nucleotide sequence, and wherein said biofilament polypeptide comprises a leader sequence that enables secretion of said biofilament polypeptide by said milk-producing cells into milk of the ruminant.

23. (New) The nucleic acid molecule of claim 22, wherein the regulatory sequence is a whey acidic protein promoter, an α S1-casein promoter, an α S2-casein promoter, a β -casein promoter, a κ -casein promoter, a β -lactoglobulin promoter, or an α -lactalbumin promoter.

24. (New) The nucleic acid molecule of claim 22, wherein the ruminant is a goat.

25. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide is spider silk.

26. (New) The nucleic acid molecule of claim 25, wherein said spider silk is dragline silk.

27. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide comprises a poly-alanine segment that forms a β -crystal.

28. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide comprises an amorphous domain that forms a β -pleated sheet with inter- β sheet spacings that are between about 3 angstroms and about 8 angstroms in size.

29. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide has a molecular weight between about 274,000 daltons to about 750,000 daltons.

30. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide comprises an amorphous domain and a crystal forming domain.

31. (New) The nucleic acid molecule of claim 30, wherein said amorphous domain and said crystal forming domain have a sequence that is at least 50% identical to SEQ ID NO: 2.

32. (New) The nucleic acid molecule of claim 31, wherein said amorphous domain and crystal forming domain have a sequence that is at least 90% identical to SEQ ID NO: 2.

33. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide comprises an amino acid sequence of SEQ ID NO: 2.

34. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide comprises a consensus sequence that is at least 50% identical to SEQ ID NO: 3.

35. (New) The nucleic acid molecule of claim 34, wherein said biofilament polypeptide has a consensus sequence that is at least 90% identical to SEQ ID NO: 3.

36. (New) The nucleic acid molecule of claim 22, wherein said biofilament polypeptide comprises an amino acid sequence of SEQ ID NO: 3.

37. (New) A mammary epithelial cell comprising the nucleic acid molecule of claim 22.

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38. (New) The mammary epithelial cell of claim 37, wherein the nucleic acid molecule is located in the genome of the cell.

39. (New) A female ruminant comprising mammary tissue cells that comprise the nucleic acid molecule of claim 22, wherein the ruminant secretes a biofilament polypeptide into milk.

40. (New) A method for producing a biofilament polypeptide, comprising: providing a female ruminant of claim 39 and isolating the biofilament polypeptide from milk produced by the female ruminant.

41. (New) A method for producing a biofilament polypeptide, comprising:

(a) culturing a cell of claim 37 under conditions in which said biofilament polypeptide is expressed and secreted into a culture medium of said culturing cell; and
(b) isolating said biofilament polypeptide from said culture medium.

42. (New) The method of claim 40 or 41, wherein said biofilament polypeptide is spider silk.

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43. (New) The method of claim 42, wherein said spider silk is dragline silk.

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44. (New) The method of claim 40 or 41, wherein said biofilament polypeptide comprises a poly-alanine segment that forms a β -crystal.

45. (New) The method of claim 40 or 41, wherein said biofilament polypeptide comprises an amorphous domain that forms a β -pleated sheet with inter- β sheet spacings that are between about 3 angstroms and about 8 angstroms in size.

46. (New) The method of claim 40 or 41, wherein said biofilament polypeptide has a molecular weight between about 274,000 daltons to about 750,000 daltons.

47. (New) The method of claim 40 or 41, wherein said biofilament polypeptide comprises an amorphous domain and a crystal forming domain.

48. (New) The method of claim 47, wherein said amorphous domain and said crystal forming domain have a sequence that is at least 50% identical to SEQ ID NO: 2.

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49. (New) The method of claim 48, wherein said amorphous domain and said crystal forming domain have a sequence that is at least 90% identical to SEQ ID NO: 2.

50. The method of claim 40 or 41, wherein said biofilament polypeptide comprises an amino acid sequence of SEQ ID NO: 2.

51. (New) The method of claim 40 or 41, wherein said biofilament polypeptide comprises a consensus sequence that is at least 50% identical to SEQ ID NO: 3.

52. (New) The method of claim 51, wherein said biofilament polypeptide has a consensus sequence that is at least 90% identical to SEQ ID NO: 3.

53. (New) The method of claim 40 or 41, wherein said biofilament polypeptide comprises an amino acid sequence of SEQ ID NO: 3.